

Complete Summary

GUIDELINE TITLE

Diagnosis and treatment of forefoot disorders. Section 1: digital deformities.

BIBLIOGRAPHIC SOURCE(S)

Clinical Practice Guideline Forefoot Disorders Panel, Thomas JL, Blitch EL IV, Chaney DM, Dinucci KA, Eickmeier K, Rubin LG, Stapp MD, Vanore JV. Diagnosis and treatment of forefoot disorders. Section 1: digital deformities. J Foot Ankle Surg 2009 Mar-Apr;48(2):230-8. [30 references] [PubMed](#)

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

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SCOPE

DISEASE/CONDITION(S)

Digital deformities, including

- Hammertoe
- Clawtoe
- Mallet toe
- Fifth toe deformity
- Crossover second toe deformity

GUIDELINE CATEGORY

Diagnosis
 Evaluation

Management
Treatment

CLINICAL SPECIALTY

Family Practice
Medical Genetics
Orthopedic Surgery
Podiatry
Radiology
Rheumatology

INTENDED USERS

Physicians
Podiatrists

GUIDELINE OBJECTIVE(S)

To provide recommendations for the diagnosis and treatment of digital deformities, including hammertoe, clawtoe, mallet toe, fifth toe deformity, and crossover second toe deformity

TARGET POPULATION

Patients with digital deformities

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis/Evaluation

1. Significant history including pain, duration of deformity, progressive or static deformity, difficulties wearing/fitting shoes, trauma
2. Physical examination
3. Clinical maneuvers such as range of motion examination, "push-up" test, drawer test
4. Standing radiographs including anterior-posterior, oblique, and lateral

Management/Treatment

1. Patient education about prevention of future problems
2. Nonsurgical treatment such as debridement of hyperkeratotic lesion, padding, corticosteroid injections, taping, footwear changes
3. Selective prophylactic surgery
4. Surgical treatment
 - Tenotomy or tendon lengthening
 - Capsuloligamentous balancing
 - Flexor tendon transfer
 - Phalangeal head resection
 - Arthrodesis of the proximal interphalangeal joint (PIPJ) and distal interphalangeal joint (DIPJ)

- Metatarsal osteotomy
 - Phalangeal base resection
 - Exostectomy
 - Amputation (partial or complete)
 - Correction of associated pathology
5. Revisional surgical techniques or nonsurgical measures for continuous symptoms

MAJOR OUTCOMES CONSIDERED

Not stated

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

A search of medical literature was performed using the EndNote, Medline/PubMed, National Library of Medicine, and Science Direct databases from 1950 to 2008. The terms used were hammertoe, clawtoe, and corn.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Not Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The recommendations for the diagnosis and treatment of digital deformities are presented in the form of an algorithm with accompanying annotations. An algorithm is provided for digital deformities. Annotations follow.

Digital Deformities (Pathway 2)

Digital deformities are among the most common forefoot pathologies encountered by foot and ankle surgeons. These deformities may be either congenital or acquired, with the incidence of digital deformities greater among females than males in almost all age groups. The proper identification of the deforming forces and resultant tendon and capsuloligamentous imbalance is critical in determining the treatment plan.

Significant History (Pathway 2, Node 1)

Patients presenting with digital deformities may either report varying degrees of pain or be asymptomatic. If pain is present, it may occur dorsally, medially, laterally, at the distal end of the toe, or plantar to the respective metatarsal head. Dorsal pain may be secondary to pressure from footwear, whereas pain at the distal end of the toe may be secondary to contracture and the resultant shift of pressure away from the more plantar padded area of the toe.

Patients may report a history of deformity since birth or early childhood. More commonly, patients will have first noticed positional changes of the toe during either early adulthood or in later years. Patients may state either that the extent of deformity of the toe seems to have reached an endpoint, or that they are still noticing a progressive increase in the deformity. They may complain of difficulty fitting into shoes secondary to the extent of the deformity of the toe. Usually the pain is exacerbated by pressure from footwear, although pain also may be experienced when not wearing shoes. Trauma (e.g., a malunited phalangeal fracture) may be an etiology of digital deformity, but this is much less common than congenital deformity or deformities acquired over the years.

Significant Findings (Pathway 2, Node 2)

Initial examination of the patient with a digital deformity may or may not reveal pain upon palpation of the toe and metatarsophalangeal joint (MPJ). Erythema and local inflammation over osseous prominences may be present. Hyperkeratotic lesions are commonly found at the proximal interphalangeal joint (PIPJ), distal interphalangeal joint (DIPJ), distal tip of the toe, or plantar to the respective metatarsal head. Hyperkeratotic lesions also may be found on the medial and/or lateral aspects of the toe or in the webspace, particularly between the fourth and fifth toes. Alternatively, ulceration of the skin may be observed in these areas, sometimes apparent only after debridement of the overlying hyperkeratosis. Plantar pain in the area of the metatarsal head may be found on palpation of this area secondary to increased retrograde pressure from digital contracture or plantar plate rupture.

The deformity must be evaluated for flexibility or rigidity, as long-standing deformities generally become less flexible. The degree and character of involvement of the DIPJ, PIPJ, and MPJ must be assessed. Because many digital deformities are increased with weightbearing, the patient is examined both seated and standing. Gait analysis also is beneficial.

Clinical Maneuvers (Pathway 2, Node 3)

Various clinical maneuvers are used to assist in the evaluation of digital deformities. A simple range of motion examination will not only help in determining the flexibility of the deformity but also help in evaluating for arthritic changes. The "push-up" test also is very valuable in determining the reducibility of the deformity. In addition, the drawer test of the MPJ will assist in identifying sagittal and transverse instability as well as aid in diagnosing the presence of plantar plate pathology.

Radiographic Findings (Pathway 2, Node 4)

During the initial evaluation of the patient, standing radiographs are recommended. The views typically include anterior-posterior, oblique, and lateral; these views aid in determining the extent and location of digital contractures as well as metatarsal phalangeal (MTP) joint deformity and/or subluxation. Associated deformities such as hallux valgus or other contributing pathology (e.g., cavus foot, metatarsus adductus) to the digital deformity(ies) also can be evaluated. In addition, the presence or absence of arthritic changes also may be determined from radiographic evaluation, particularly those changes associated

with systemic process such as rheumatoid arthritis and the inflammatory arthritides. Although a bone scan, magnetic resonance imaging (MRI), or computed tomography (CT) scan may be ordered, they are rarely needed in the diagnosis of a lesser digital deformity.

Diagnosis (Pathway 2, Node 5)

After consideration of the history, examination, radiography, and clinical maneuver results, diagnosis of the type and extent of digital deformity can be made. Deformities of the lesser toes are defined classically as hammertoe, clawtoe, and mallet toe. Although these deformities are all very similar to each other, a few minor differences exist. Hammertoe refers to the deformity that consists of an extension contracture at the MPJ, flexion contracture at the PIPJ, and hyperextension at the DIPJ. Clawtoe deformity exhibits an extension contracture at the MPJ and a flexion contracture at both the PIPJ and DIPJ. A toe whose only deformity consists of a flexion contracture at the DIPJ is termed a mallet toe.

Refer to the original guideline document for information on other types of digital deformities.

Differential Diagnosis (Pathway 2, Node 6)

Other local pathologies besides digital deformity or contracture may give rise to symptoms in a lesser toe. A phalangeal exostosis may be of sufficient size to cause pain from footwear pressure or may result in impingement on an adjacent toe. These may be associated with a hyperkeratotic lesion and may be seen with or without other digital deformity. Bursitis may be present at any area of increased pressure secondary to exostosis or deformity. Many forms of arthritis, particularly rheumatoid arthritis and some of the seronegative arthritides, may manifest themselves in symptoms at the MPJ and PIPJ or DIPJ. A fracture must be ruled out, especially in the setting of acute onset of pain involving injury.

Asymptomatic Digital Deformity (Pathway 2, Node 7)

In the setting of a digital deformity that is asymptomatic, advising the patient on the prevention of future problems (e.g., changes in footwear) may be all that is necessary. At times, prophylactic correction of digital deformities in the patient with diabetic peripheral neuropathy may be undertaken to prevent future ulceration.

Symptomatic Digital Deformity (Pathway 2, Node 8)

Symptomatic digital deformities may be treated nonsurgically or surgically, depending on multiple factors. These include degree of deformity, duration and severity of symptoms, previous treatment, associated medical conditions, and ability to perform work duties comfortably.

Nonsurgical Treatment Options (Pathway 2, Node 9)

Nonsurgical treatment is often the initial treatment choice for the symptomatic digital deformity. Various padding techniques exist, serving to cushion or offload pressure points that may involve both the affected toe(s) as well as its respective metatarsal head plantarly. Orthotic devices or shoe insole modifications using a metatarsal pad may offer relief of excessive metatarsal head pressures. Debridement of associated hyperkeratotic lesions usually is effective in helping to reduce symptoms. If local inflammation or bursitis exists, a corticosteroid injection into the affected area may be beneficial. Taping to reduce and splint flexible deformities may be performed, especially in the setting of an early crossover second toe deformity. Last but not least, footwear changes such as a wider and/or deeper toe box may be used to accommodate the deformity and decrease shoe pressure over osseous prominences.

Surgical Treatment Options (Pathway 2, Node 10)

The surgical treatment of digital deformities includes a spectrum of soft tissue and osseous procedures. The degree and flexibility of the deformity along with any associated pathology determine the surgical procedure(s) to be performed.

When the deformity is manually reducible, tenotomy or tendon lengthening at the level of the MPJ, PIPJ, or DIPJ may be sufficient for deformity correction; however, this may require combining with capsular and/or ligamentous release (or reefing), especially at the level of the MPJ. In some cases, phalangeal head resection (partial or complete) and/or flexor tendon transfer also may be necessary.

When the deformity is only manually semi-reducible or rigid, both osseous and soft tissue procedures often are performed in combination. Osseous procedures of the toe include phalangeal head resection (with or without implant) and arthrodesis of the PIPJ and DIPJ. Sometimes metatarsal osteotomy, partial metatarsal head resection, or phalangeal base resection may be required to achieve complete correction of the digital deformity, especially at the level of the MPJ. Soft tissue procedures are commonly utilized to augment osseous procedures in this patient population; soft tissue procedures include all of the aforementioned procedures for flexible deformities. Exostectomy also may be beneficial, particularly in addressing hyperkeratotic lesions along the medial or lateral aspects of the toe. Partial amputation of the toe may be indicated in some cases, especially in conditions involving the fifth toe. In selected cases, complete amputation of a lesser toe may be considered to allow shoe fitting, such as in the coexistence of second toe deformity and hallux valgus deformity in an elderly patient.

Correction of associated conditions may be indicated in the surgical care of some digital deformities. This is especially true in crossover second toe deformity, where hallux valgus deformity often is seen concurrently and may influence attempts at correction of the second toe deformity. Surgical repair of associated tears of the plantar plate also has been advocated (see the National Guideline Clearinghouse [NGC] summary of the American College of Foot and Ankle Surgeons [ACFAS] guideline [Central Metatarsalgia](#)). In addition, correction of other forefoot, midfoot, or hindfoot conditions contributing to the formation of digital deformity may be indicated.

Continued Symptoms (Pathway 2, Node 11)

Treatment of the patient who continues to experience symptoms after surgical care of a digital deformity may require a variety of revisional surgical techniques and/or nonsurgical measures. In some cases, recurrence of the original deformity or migration of phalangeal segments occur as a complication of the original repair. Revisional surgery alternatives are similar to the above for original procedural selection.

CLINICAL ALGORITHM(S)

An algorithm is presented in the original guideline document for digital deformities.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is not specifically stated for each recommendation.

This clinical practice guideline is based upon consensus of current clinical practice and review of the clinical literature.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate diagnosis and treatment of digital deformities

POTENTIAL HARMS

In some cases of surgical treatment for digital deformities, recurrence of the original deformity or migration of phalangeal segments occur as a complication of the original repair.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Clinical Algorithm
Foreign Language Translations
Patient Resources

For information about [availability](#), see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Clinical Practice Guideline Forefoot Disorders Panel, Thomas JL, Blitch EL IV, Chaney DM, Dinucci KA, Eickmeier K, Rubin LG, Stapp MD, Vanore JV. Diagnosis and treatment of forefoot disorders. Section 1: digital deformities. J Foot Ankle Surg 2009 Mar-Apr;48(2):230-8. [30 references] [PubMed](#)

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2009 Mar-Apr

GUIDELINE DEVELOPER(S)

American College of Foot and Ankle Surgeons - Medical Specialty Society

SOURCE(S) OF FUNDING

American College of Foot and Ankle Surgeons

GUIDELINE COMMITTEE

Clinical Practice Guideline Forefoot Disorders Panel

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the [American College of Foot and Ankle Surgeons Web site](#).

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

The following is available:

- Foot health facts: Foot and ankle conditions. 2009. Available in Spanish and English from the [American College of Foot and Ankle Surgeons consumer Web site](#).

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NGC STATUS

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